ELECTRIC CHARGES

Electrostatics is a type of electricity that does not move from one point to another in the substance in which it is produced. The study of electrostatics is the study of charges at rest.

Production of Charges

Rub the barrel of a plastic biro or ball pen on a very dry hair. Hold the rubbed pen near some small pieces of paper and observe the effect of the pen on the paper.

You would possibly find out that the rubbed plastic biro attracts the small pieces of paper. The plastic passing through the dry hair as well as the hair itself acquire some electric charge by friction between the two and is said to be electrified or charged or to have a charge. Similarly, a plastic biro or ruler rubbed vigorously on a shirt would acquire electric charge by friction between the rulers and the shirt.

Other observations of static electricity in our daily life are a dry sweater and our skin, a nylon cloth and our dry skin, etc.

Types of Charges

Rub a glass rod vigorously with silk and suspend it by a thread with a paper stirrup. Rub another glass rod with silk and bring it near the first rod. Notice the repulsion between the two.

In a similar fashion, rub an ebonite rod with fur and bring it near the suspended glass rod. Observe the attraction between the two rods.

Now replace the suspended glass rod with an ebonite rod which has been charged by rubbing with fur. Repeat the previous experiment by bringing a charged ebonite rod and a charged glass rod in turn towards the suspended ebonite rod; observe that attraction and repulsion occur when the charged glass and ebonite rods are brought near the suspended ebonite rod.

The above experiments prove that the charge on the ebonite rod is different from that on the glass rod. An ebonite rod rubbed with fur has a *negative charge*, but a glass rod rubbed with silk has a *positive charge*. Nowadays we can also obtain a positive charge by

rubbing cellulose acetate strip with silk and a negative charge by rubbing polythene rod with fur. The cellulose acetate strip and the polythene rod are less affected by moist conditions in the laboratory.

The results of the above experiments show that a positively charged glass rod attracts a negatively charged ebonite rod but repels another positively charged glass rod. Also a negatively charged ebonite rod attracts a positively charged glass rod but repels another negatively charged ebonite rod. The results lead to the conclusion that "*like or similar charges repel each other while unlike or opposite charges attract each other,*" as a fundamental law of static electricity.